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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,190	04/02/2004	Steven George Hansen	081468-0309021	7518

909 7590 09/22/2005

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EXAMINER

GUTIERREZ, KEVIN C

ART UNIT	PAPER NUMBER
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2851

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/816,190

Applicant(s)

HANSEN ET AL.

Examiner

Kevin Gutierrez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
4a) Of the above claim(s) 4-8 and 11-13 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-3, 9, 10 and 14-20 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date August 18, 2004.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species I - claims 1-3, 9-10 and 14-20 in the reply filed on September 1, 2005 is acknowledged.
2. Claims 4-8 and 11-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Species, there being no allowable generic or linking claim. Election was made without traverse in the reply filed on September 1, 2005.

Specification

3. The disclosure is objected to because of the following informalities:

Page 6, [0028], line 1 - "Figures 2A to B..." The underlined text should be replaced with "2C" as respectfully suggested by the Examiner.

Appropriate correction is required.

Drawings

4. Figure 3B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the one optical

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element and polarizer (page 16, claims 1 and 18) and their specific location within the apparatus must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

6. Claim 16 objected to as failing to provide proper antecedent basis for the claimed subject matter: Page 17, claim 16, last line -“...of said diaphragm.” The underlined text lacks proper antecedent basis.

7. Claim 16 is objected to because of the following informalities:

(a) Page 17, claim 16, “...wherein said polarize ...” The underlined text should be replaced with --polarizer-- as suggested by the Examiner.

(b) Page 17, claim 16, “...polarizers mounted in the or each aperture ...” The underlined text should be deleted as suggested by the Examiner.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-3, 9, and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al (5,729,331).

10. Regarding claims 1, 18 and 19, Tanaka et al discloses

- “an illumination system (10) for providing a projection beam of radiation (col. 9, lines 6-7);

- a support structure for (mask stage; 80) supporting patterning structure (8), the patterning structure serving to impart the projection beam with a pattern in its cross-section (col. 12, lines 47-49);
- a substrate table (plate stage; 60) for holding a substrate (plate; 9);
- a projection system (2a-2g) for projecting the patterned beam onto a target portion of the substrate (col. 12, lines 11-13);
- at least one optical element (field stop; 107) constructed and arranged to define an on-axis, substantially rectilinear intensity distribution on the projection beam (col. 9, lines 42-44); and
- a polarizer, constructed and arranged to impart a linear polarization to the projection beam (col. 41, lines 41-42)."

Regarding claim 2, Tanaka et al discloses "wherein said intensity distribution is a rectangle having an aspect ratio not equal to 1 (see fig. 4, where exposure regions of 111a-111g have rectangular distributions), and the longer dimension of the rectangle is parallel to the X or Y axis of the apparatus (see fig. 4, where longer dimension of rectangle of 107 is parallel along Y-axis)."

Regarding claim 3, Tanaka et al discloses "wherein said linear polarization is substantially parallel to the longer dimension of the rectangle (col. 39, lines 44-48, where 701 comprises an illumination optical system in fig. 4, which the polarization (in reference to fig. 45) is substantially parallel to the longer dimensions of 107a-b)."

Regarding claim 9, Tanaka et al discloses "wherein the center of said intensity distribution lies on the optical axis of the illumination system (see fig. 4, where 111a

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has exposure region (dotted lines forming rectangle) centered around optical axis (solid-dashed line along z-axis).”

Regarding claim 17, Tanaka et al discloses “wherein said polarize comprises a radiation source that emits a linearly polarized beam (col. 41, lines 41-44).”

Regarding claim 20, Tanaka et al discloses “wherein in said linearly polarizing, the direction of the linear polarization imparted to the beam is substantially parallel to lines of said pattern (col. 32, lines 1-2).”

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al in view of Inoue et al (5,673,103).

Tanaka et al discloses a patterning structure, but does not disclose “a phase-shift mask as said patterning structure.”

However, having “a phase shift-mask as said patterning structure” is known to the art as it is evident by the teaching of Inoue et al (col. 7, lines 41-43, where a phase shift mask can be used instead of a photomask).” Thus, it would have been

obvious to one ordinary skilled in the art at the time the invention was made to modify the patterning structure of Tanaka et al by using a phase shift mask for at least the purpose of controlling the polarization characteristics of the projected beam.

13. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al in view of Orino (US 2003/0020892).

Tanaka et al discloses an optical element, but does not disclose “wherein said at least one optical element comprises a set of moveable blades.”

However, having an optical element where it comprises a set of moveable blades is known to the art as it is evident by the teaching of Orino ([0041], lines 3-6, where Orino has a masking blade with 4 moveable parts). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the optical element of Tanaka et al by having moveable blades for at least the varying the illumination range on the plane of the mask.

14. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al in view of Orino, as applied to claim 14, and in further view of Onanian (4,568,148).

Tanaka et al, as modified, discloses all of the claimed limitations except “wherein said polarize comprises polarizers mounted in the or each aperture of said diaphragm.”

However, having “said polarize comprises polarizers mounted in the or each aperture of said diaphragm” is known to the art as it is evident by the teaching of Onanian (col. 8, lines 1-2, where the polarizing wheels have polarizing arcuate segments). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the polarizer of Tanaka et al by using a polarizing wheel for at least the purpose to obtain an image of a higher resolution.

15. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al in view of Nishi (6,608,665).

Tanaka et al discloses at least one optical element with an aperture corresponding to said intensity distribution. Tanaka et al does not disclose wherein said at least one optical element comprises a diaphragm having an aperture or apertures corresponding to said intensity distribution.”

However, having “at least one optical element comprises a diaphragm having an aperture or apertures corresponding to said intensity distribution” is known to the art as it is evident by the teaching of Nishi (see fig. 9, where 56 is diaphragm with apertures 58-61). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the optical element of Tanaka et al by having a diaphragm with variable apertures for at least the purpose to adjust the intensity distribution of the illumination or exposure light.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following discloses an apparatus that utilizes an optical element with rectilinear characteristics in the path of a projected beam: Taniguchi (6,310,680), Hirukawa (6,661,498), Smith et al (6,556,361), Smith (US 2002/0126267), Tanabe (5,559,583), Kohno (5,448,350), Ooah et al (5,949,078), Shiraishi (6,421,123), Lan et al (US 2004/0233406), Nishi (5,473,410), Ozawa (US 2001/0035945), Unno (6,077,631), Yamada et al (6,222,195) and Sandusky (6,750,968).

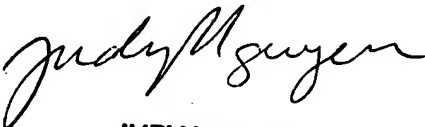
17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Gutierrez whose telephone number is (571)-272-5922. The examiner can normally be reached on Monday-Friday: 7:30 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin Gutierrez
Examiner
Art Unit 2851

September 15, 2005


JUDY NGUYEN
SUPERVISORY PATENT EXAMINER